



EIMAC
A Division of Varian Associates
SAN CARLOS, CALIFORNIA

EM1300
MAGNETICALLY SHIELDED
VOLTAGE TUNABLE
MAGNETRON
250 - 500 Mc
100 mw

DESCRIPTION

The EM1300 Voltage Tunable Magnetron Oscillator delivers at least 100 mw over the frequency range of 250-500 mc. This miniature magnetically shielded oscillator is ideally suited for applications requiring compact lightweight packaging. Its unique magnetic circuit results in negligible external magnetic field and permits the tube to contact other ferromagnetic materials with no degradation in performance.

FEATURES

- Magnetically Shielded
- Light Weight
- Linear Voltage Tuning
- Small Size
- Rugged
- Flat Power Output



TYPICAL PERFORMANCE

ELECTRICAL

Frequency Range	- - - - -	250-500 Mc
Anode Voltage	- - - - -	920-1840 V
Cathode Current	- - - - -	0.5-2 mA
Typical Power Output	- - - - -	140 mw
Anode FM Sensitivity	- - - - -	0.3 Mc/V
Injection Anode Voltage	- - - - -	200 Volts
Injection Anode Current	- - - - -	0.0 mA
Heater Voltage (AC or DC)	- - - - -	6.3 Volts
Heater Current (AC or DC)	- - - - -	0.9 Amp
Load Impedance	- - - - -	50 Ohm
Load VSWR	- - - - -	1.1:1
Power Variation	- - - - -	±1 db

MECHANICAL

Operating Position	- - - - -	- - - - - Any
Cooling	- - - - -	- - - - - Conduction
Electrical Connection	- - - - -	- - - - - Flying Leads
RF Output Coupling	- - - - -	- - - - - TNC Female
Weight	- - - - -	- - - - - 1.8 lbs.

MAXIMUM RATINGS*

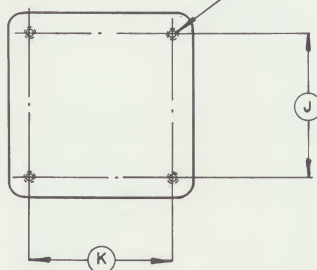
Anode Voltage	- - - - -	2200 Volts
Cathode Current	- - - - -	10 mA
Injection Anode Voltage	- - - - -	500 Volts
Injection Anode Current	- - - - -	0.5 mA
Load VSWR	- - - - -	3:1

*Damage to the tube may occur if maximum ratings are exceeded.

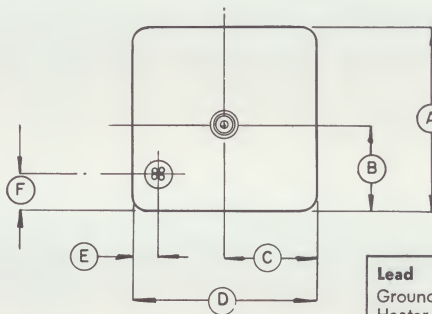
**NOTES:**

1. The operating frequency is a function of the anode voltage; therefore any voltage ripple on the anode supply appears as frequency modulation on the RF output.
2. The heater supply may be either alternating or direct current. If direct current is used, the heater connections *must* be connected to the negative terminal of the heater supply.
3. Cooling—To insure optimum tube performance, the magnet shell should be maintained below 70° C.
4. Temperature Stability — The permanent magnet of the shielded VTM has been temperature stabilized to minimize frequency changes caused by variations in the magnet temperature. The temperature/frequency coefficient for the shielded VTM is 0.008% of the operating frequency per degree centigrade. A positive change in temperature will always produce a positive change in frequency.

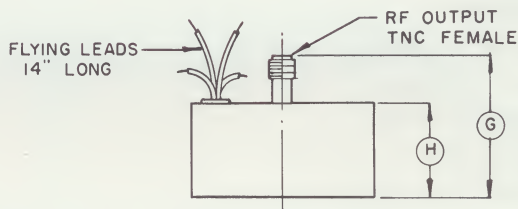
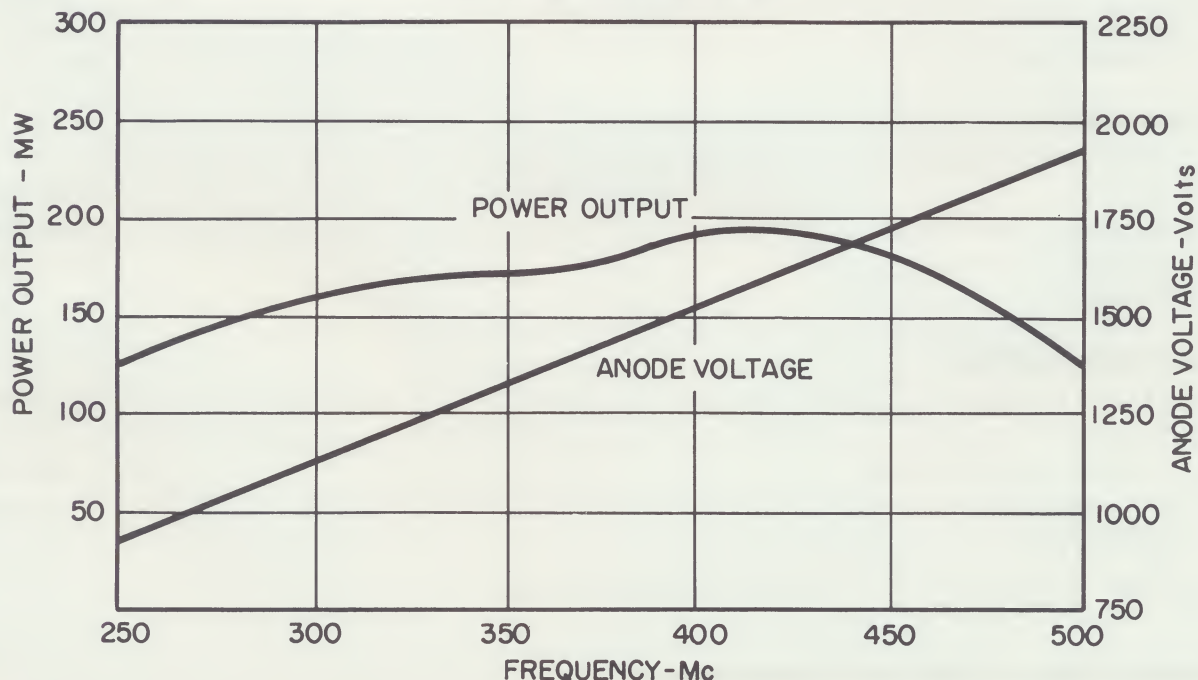
10-32 UNF 3/8 DEEP (4 HOLES)



DIMENSIONS IN INCHES			
DIMENSIONAL DATA			
REF.	MIN.	MAX.	NOM.
A		3.050	
B	1.200	1.800	
C	1.300	1.700	
D		3.050	
E	.300	.500	
F	.700	.900	
G		2.300	
H		1.525	
J	2.320	2.380	
K	2.320	2.380	



Lead	Color Code
Ground	Black
Heater	Blue
Heater Cathode	Red
Injection Anode	White

**CHARACTERISTIC CURVES**
Typical Performance Values



EIMAC

A Division of Varian Associates
SAN CARLOS, CALIFORNIA

EM1310

**MAGNETICALLY SHIELDED
VOLTAGE TUNABLE
MAGNETRON**

500 -1000 Mc

100 mw

DESCRIPTION

The EM1310 Voltage Tunable Magnetron Oscillator delivers at least 100 mw over the frequency range of 500-1000 Mc. This miniature magnetically shielded oscillator is ideally suited for applications requiring compact lightweight packaging. Its unique magnetic circuit results in negligible external magnetic field and permits the tube to contact other ferromagnetic materials with no degradation in performance.

FEATURES

- Magnetically Shielded
- Light Weight
- Linear Voltage Tuning
- Small Size
- Flat Power Output
- Rugged



TYPICAL PERFORMANCE

ELECTRICAL

Frequency Range -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	500-1000 Mc
Anode Voltage -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	920-1840 V
Cathode Current -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.5-2 mA
Typical Power Output -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	150 mw
Anode FM Sensitivity -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.55 Mc/V
Injection Anode Voltage -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	150 Volts
Injection Anode Current -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.0 mA
Heater Voltage (AC or DC) -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	6.3 Volts
Heater Current (AC or DC) -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	0.86 Amp
Load Impedance -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	50 Ohm
Load VSWR -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.1:1
Power Variation -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	±1 db

MECHANICAL

Operating Position -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Any
Cooling -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Conduction
Electrical Connection -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Flying Leads
RF Output Coupling -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TNC Female
Weight -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.5 lbs. max.

MAXIMUM RATINGS*

Anode Voltage -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2200 Volts
Cathode Current -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	10 mA
Injection Anode Voltage -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	500 Volts
Injection Anode Current -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 mA
Load VSWR -	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3:1

*Damage to the tube may occur if maximum ratings are exceeded.

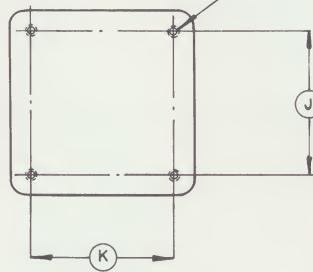
(Effective 12-15-51) Copyright 1965 by Varian Associates

(Effective 12-15-65) Copyright 1965 by Varian Associates

**NOTES:**

1. The operating frequency is a function of the anode voltage; therefore any voltage ripple on the anode supply appears as frequency modulation on the RF output.
2. The heater supply may be either alternating or direct current. If direct current is used, the heater connections *must* be connected to the negative terminal of the heater supply.
3. Cooling—To insure optimum tube performance, the magnet shell should be maintained below 70° C.
4. Temperature Stability — The permanent magnet of the shielded VTM has been temperature stabilized to minimize frequency changes caused by variations in the magnet temperature. The temperature/frequency coefficient for the shielded VTM is 0.008% of the operating frequency per degree centigrade. A positive change in temperature will always produce a positive change in frequency.

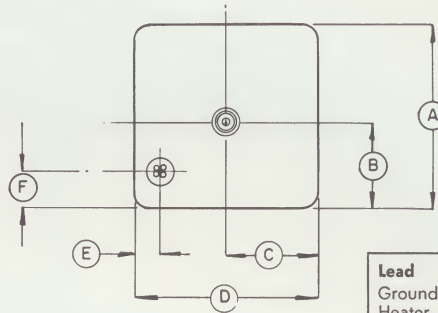
10-32 UNF 3/8 DEEP (4 HOLES)



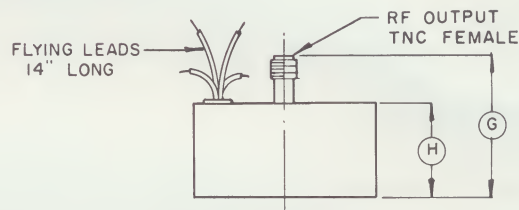
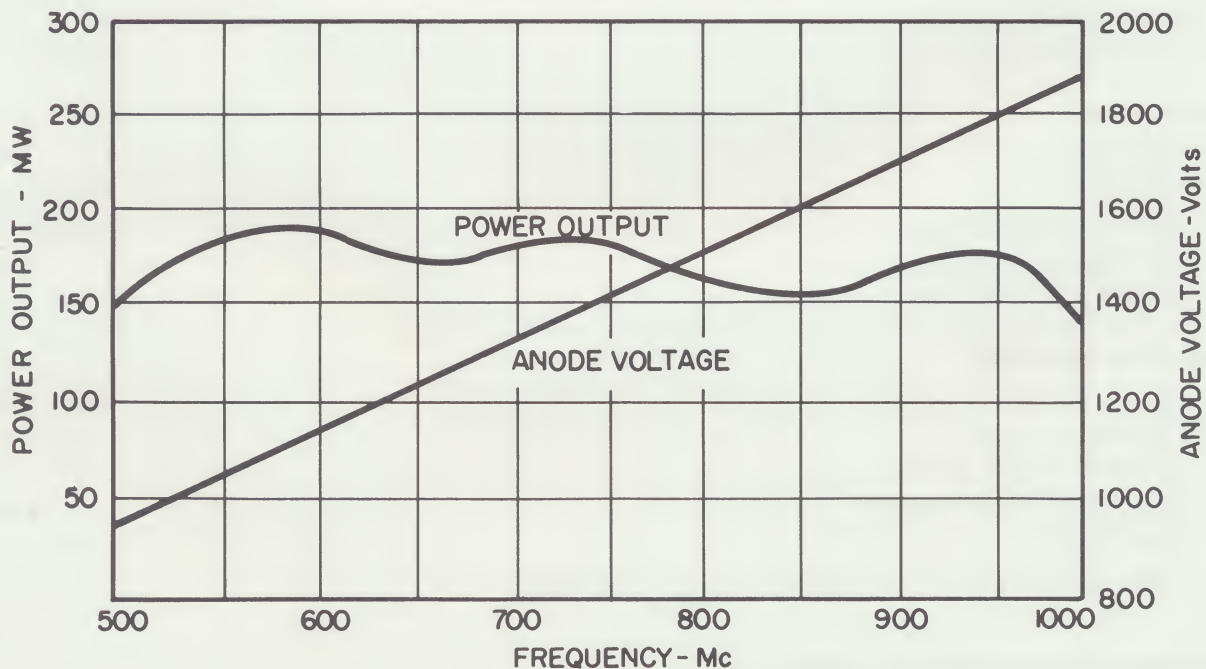
DIMENSIONS IN INCHES

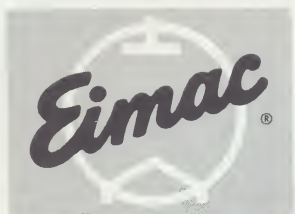
DIMENSIONAL DATA

REF.	MIN.	MAX.	NOM.
A		3.050	
B	1.200	1.800	
C	1.300	1.700	
D		3.050	
E	.300	.500	
F	.700	.900	
G		2.300	
H		1.525	
J	2.320	2.380	
K	2.320	2.380	



Lead	Color Code
Ground	Black
Heater	Blue
Heater Cathode	Red
Injection Anode	White

**CHARACTERISTIC CURVES**
Typical Performance Values



EIMAC
A Division of Varian Associates
SAN CARLOS, CALIFORNIA

EM1320
MAGNETICALLY SHIELDED
VOLTAGE TUNABLE
MAGNETRON
1000 - 2000 Mc
100 mw

DESCRIPTION

The EM1320 Voltage Tunable Magnetron Oscillator delivers at least 100 mw over the frequency range of 1000-2000 mc. This miniature magnetically shielded oscillator is ideally suited for applications requiring compact lightweight packaging. Its unique magnetic circuit results in negligible external magnetic field and permits the tube to contact other ferromagnetic materials with no degradation in performance.

FEATURES

- Magnetically Shielded
- Light Weight
- Linear Voltage Tuning
- Small Size
- Flat Power Output
- Rugged



TYPICAL PERFORMANCE

ELECTRICAL

Frequency Range	-	-	-	-	-	-	-	-	-	-	-	-	1000-2000 Mc
Anode Voltage	-	-	-	-	-	-	-	-	-	-	-	-	920-1840 V
Cathode Current	-	-	-	-	-	-	-	-	-	-	-	-	1-6 mA
Typical Power Output	-	-	-	-	-	-	-	-	-	-	-	-	200 mw
Anode FM Sensitivity	-	-	-	-	-	-	-	-	-	-	-	-	1 Mc/Volt
Injection Anode Voltage	-	-	-	-	-	-	-	-	-	-	-	-	200 Volts
Injection Anode Current	-	-	-	-	-	-	-	-	-	-	-	-	0.0 mA
Heater Voltage (AC or DC)	-	-	-	-	-	-	-	-	-	-	-	-	6.3 Volts
Heater Current (AC or DC)	-	-	-	-	-	-	-	-	-	-	-	-	0.9 Amp
Load Impedance	-	-	-	-	-	-	-	-	-	-	-	-	50 Ohm
Load VSWR	-	-	-	-	-	-	-	-	-	-	-	-	1.1:1
Power Variation	-	-	-	-	-	-	-	-	-	-	-	-	±1 db

MECHANICAL

Operating Position	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Any
Cooling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Conduction
Electrical Connection	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	Flying Leads
RF Output Coupling	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	TNC Female
Weight	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1.5 lbs.

MAXIMUM RATINGS*

Anode Voltage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	2200 Volts
Cathode Current	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	12 mA
Injection Anode Voltage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	500 Volts
Injection Anode Current	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	1 mA
Load VSWR	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	3:1

*Damage to the tube may occur if maximum ratings are exceeded.

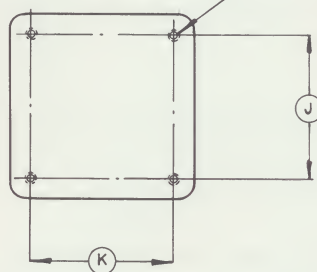
~~(Effective 12-15-51) Copyright 1965 by Varian Associates~~

(Effective 12-15-65) Copyright 1965 by Varian Associates

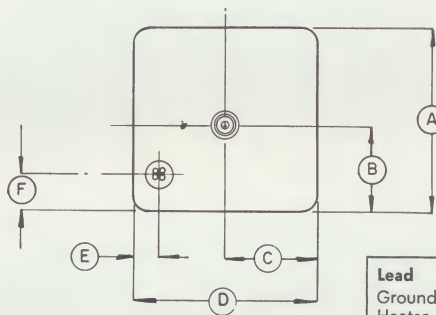
**NOTES:**

1. The operating frequency is a function of the anode voltage; therefore any voltage ripple on the anode supply appears as frequency modulation on the RF output.
2. The heater supply may be either alternating or direct current. If direct current is used, the heater connections *must* be connected to the negative terminal of the heater supply.
3. Cooling—To insure optimum tube performance, the magnet shell should be maintained below 70° C.
4. Temperature Stability — The permanent magnet of the shielded VTM has been temperature stabilized to minimize frequency changes caused by variations in the magnet temperature. The temperature/frequency coefficient for the shielded VTM is 0.008% of the operating frequency per degree centigrade. A positive change in temperature will always produce a positive change in frequency.

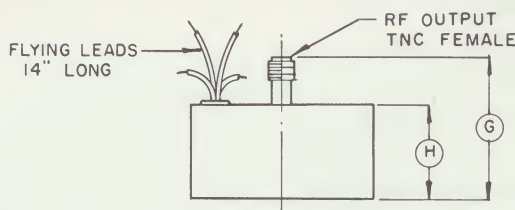
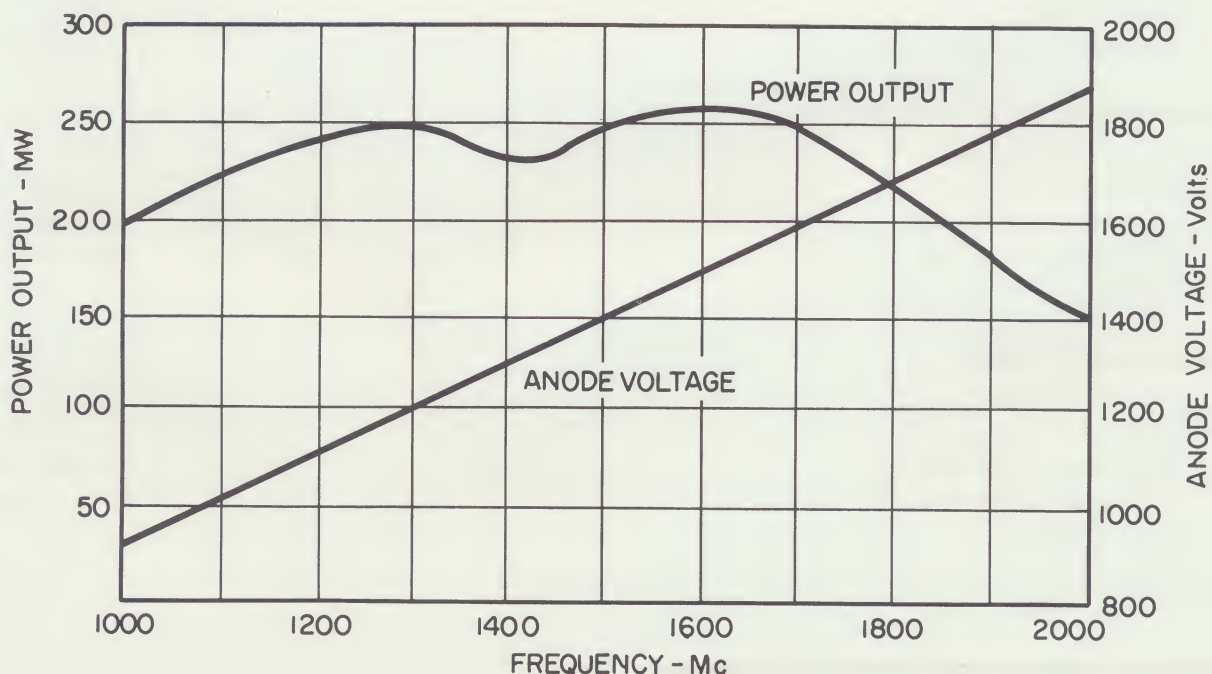
10-32 UNF 3/8 DEEP (4 HOLES)



DIMENSIONS IN INCHES			
DIMENSIONAL DATA			
REF.	MIN.	MAX.	NOM.
A		3.050	
B	1.200	1.800	
C	1.300	1.700	
D		3.050	
E	.300	.500	
F	.700	.900	
G		2.300	
H		1.525	
J	2.320	2.380	
K	2.320	2.380	



Lead	Color Code
Ground	Black
Heater	Blue
Heater Cathode	Red
Injection Anode	White

**CHARACTERISTIC CURVES**
Typical Performance Values



EIMAC
A Division of Varian Associates
SAN CARLOS, CALIFORNIA

EM1320
MAGNETICALLY SHIELDED
VOLTAGE TUNABLE
MAGNETRON
1000 - 2000 Mc
100 mw

DESCRIPTION

The EM1320 Voltage Tunable Magnetron Oscillator delivers at least 100 mw over the frequency range of 1000-2000 mc. This miniature magnetically shielded oscillator is ideally suited for applications requiring compact lightweight packaging. Its unique magnetic circuit results in negligible external magnetic field and permits the tube to contact other ferromagnetic materials with no degradation in performance.

FEATURES

- Magnetically Shielded
- Light Weight
- Linear Voltage Tuning
- Small Size
- Flat Power Output
- Rugged



TYPICAL PERFORMANCE

ELECTRICAL

Frequency Range	- - - - -	1000-2000 Mc
Anode Voltage	- - - - -	920-1840 V
Cathode Current	- - - - -	1-6 mA
Typical Power Output	- - - - -	200 mw
Anode FM Sensitivity	- - - - -	1 Mc/Volt
Injection Anode Voltage	- - - - -	200 Volts
Injection Anode Current	- - - - -	0.0 mA
Heater Voltage (AC or DC)	- - - - -	6.3 Volts
Heater Current (AC or DC)	- - - - -	0.9 Amp
Load Impedance	- - - - -	50 Ohm
Load VSWR	- - - - -	1.1:1
Power Variation	- - - - -	±1 db

MECHANICAL

Operating Position	- - - - -	- - - - - Any
Cooling	- - - - -	- - - - - Conduction
Electrical Connection	- - - - -	- - - - - Flying Leads
RF Output Coupling	- - - - -	- - - - - TNC Female
Weight	- - - - -	- - - - - 1.5 lbs.

MAXIMUM RATINGS*

Anode Voltage	- - - - -	2200 Volts
Cathode Current	- - - - -	12 mA
Injection Anode Voltage	- - - - -	500 Volts
Injection Anode Current	- - - - -	1 mA
Load VSWR	- - - - -	3:1

*Damage to the tube may occur if maximum ratings are exceeded.

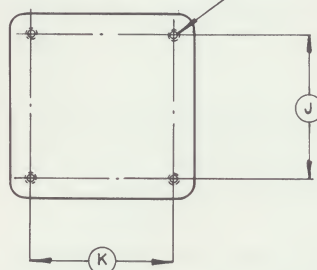
~~(Effective 12-15-51) Copyright 1965 by Varian Associates~~

(Effective 12-15-65) Copyright 1965 by Varian Associates

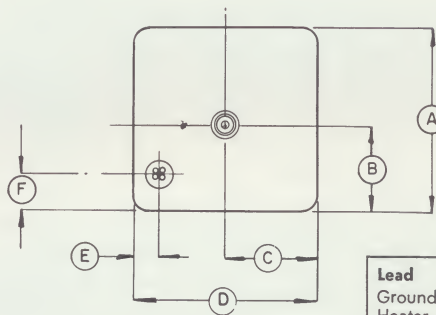
**NOTES:**

1. The operating frequency is a function of the anode voltage; therefore any voltage ripple on the anode supply appears as frequency modulation on the RF output.
2. The heater supply may be either alternating or direct current. If direct current is used, the heater connections *must* be connected to the negative terminal of the heater supply.
3. Cooling—To insure optimum tube performance, the magnet shell should be maintained below 70° C.
4. Temperature Stability — The permanent magnet of the shielded VTM has been temperature stabilized to minimize frequency changes caused by variations in the magnet temperature. The temperature/frequency coefficient for the shielded VTM is 0.008% of the operating frequency per degree centigrade. A positive change in temperature will always produce a positive change in frequency.

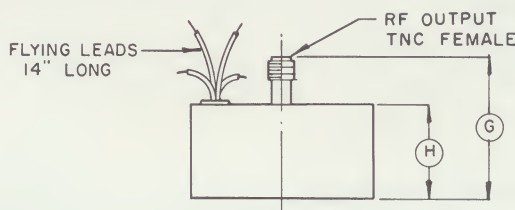
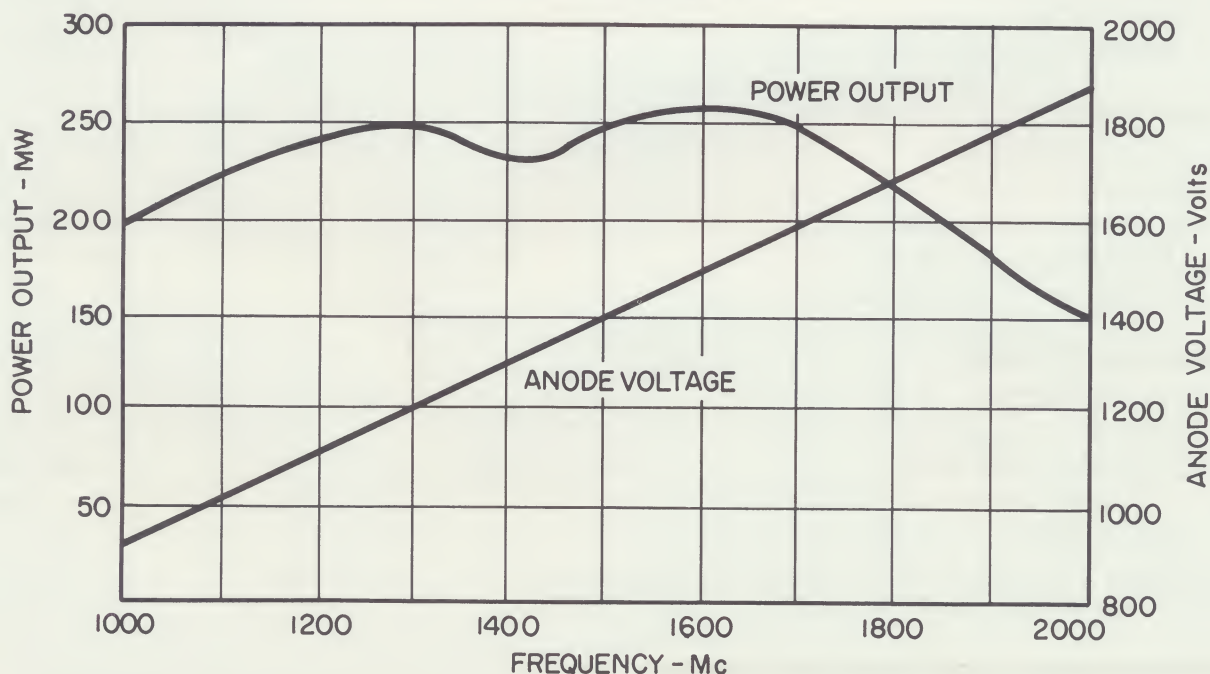
10-32 UNF 3/8 DEEP (4 HOLES)

DIMENSIONS IN INCHES
DIMENSIONAL DATA

REF.	MIN.	MAX.	NOM.
A		3.050	
B	1.200	1.800	
C	1.300	1.700	
D		3.050	
E	.300	.500	
F	.700	.900	
G		2.300	
H		1.525	
J	2.320	2.380	
K	2.320	2.380	



Lead	Color Code
Ground	Black
Heater	Blue
Heater Cathode	Red
Injection Anode	White

**CHARACTERISTIC CURVES**
Typical Performance Values



EIMAC

A Division of Varian Associates
SAN CARLOS, CALIFORNIA

EM1331

MAGNETICALLY SHIELDED
VOLTAGE TUNABLE
MAGNETRON

2200 - 2300 Mc

35 Watts

DESCRIPTION

The EM1331 Voltage Tunable Magnetron Oscillator delivers at least 35 watts over the frequency range of 2200-2300 Mc. This miniature magnetically shielded oscillator is ideally suited for applications requiring compact lightweight packaging. Its unique magnetic circuit results in negligible external magnetic field and permits the tube to contact other ferromagnetic materials with no degradation in performance.

FEATURES

- Magnetically Shielded
- Light Weight
- Linear Voltage Tuning
- Small Size
- Flat Power Output



TYPICAL PERFORMANCE

ELECTRICAL

Frequency Range	- - - - -	2200-2300 Mc
Anode Voltage	- - - - -	2060-2160 V
Cathode Current	- - - - -	41-44 mA
Typical Power Output	- - - - -	40-42 W
Anode FM Sensitivity	- - - - -	1 Mc/Volt
Injection Anode Voltage	- - - - -	500 Volts
Injection Anode Current	- - - - -	0.0 mA
Heater Voltage (AC or DC)	- - - - -	6.3 Volts
Heater Current (AC or DC)	- - - - -	1.0 Amp
Load Impedance	- - - - -	50 Ohm
Load VSWR	- - - - -	1.1:1
Power Variation	- - - - -	1 db

MECHANICAL

Operating Position	- - - - -	- - - Any
Cooling	- - - - -	- Forced Air
Electrical Connection	- - - - -	- Flying Leads
RF Output Coupling	- - - - -	- TNC Female
Weight	- - - - -	- 3.5 lbs. max.

MAXIMUM RATINGS*

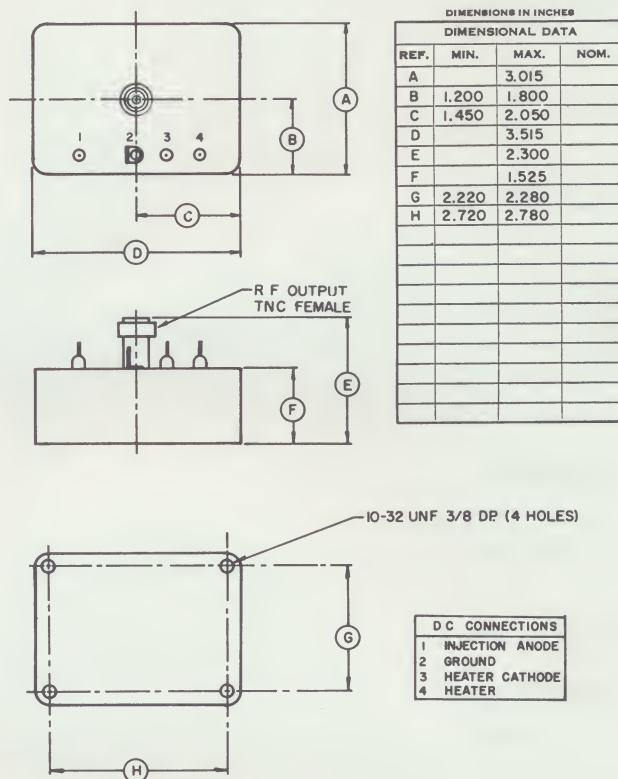
Anode Voltage	- - - - -	2500 Volts
Cathode Current	- - - - -	60 mA
Injection Anode Voltage	- - - - -	750 Volts
Injection Anode Current	- - - - -	1 mA
Load VSWR	- - - - -	1.2:1

*Damage to the tube may occur if maximum ratings are exceeded.

~~(Effective 12-15-51) Copyright 1965 by Varian Associates~~

(Effective 12-15-65) Copyright 1965 by Varian Associates

1. The operating frequency is a function of the anode voltage; therefore any voltage ripple on the anode supply appears as frequency modulation on the RF output.
2. The heater supply may be either alternating or direct current. If direct current is used, the heater connections *must* be connected to the negative terminal of the heater supply.
3. Cooling—To insure optimum tube performance, the magnet shell should be maintained below 70° C.
4. Temperature Stability — The permanent magnet of the shielded VTM has been temperature stabilized to minimize frequency changes caused by variations in the magnet temperature. The temperature/frequency coefficient for the shielded VTM is 0.008% of the operating frequency per degree centigrade. A positive change in temperature will always produce a positive change in frequency.



Typical Performance Values

